



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

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CHICAGO, IL 60604-3590

MAY 12 2015

REPLY TO THE ATTENTION OF:

E-19J

Cindy Bladey
Chief, Rules, Announcements, and Directives Branch
Division of Administrative Services
Office of Administration
Mail Stop: 16 3WFN-06-A44MP
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Draft Plant-Specific Supplement 55 to the Generic Environmental Impact Statement for License Renewal of Nuclear Plants Regarding Braidwood Station, Units 1 and 2, Braidwood, Will County, Illinois – CEQ #20150078

Dear Ms. Bladey:

The U.S. Environmental Protection Agency has reviewed the Draft Supplemental Environmental Impact Statement (EIS) for the above-mentioned project prepared by the Nuclear Regulatory Commission (NRC). Our comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act.

Braidwood is a two-unit nuclear, pressurized-water reactor located in Will County, Illinois. Commercial operation began in 1988. Braidwood is owned and operated by Exelon Generation Company, LLC (the applicant). The existing licenses will expire on October 17, 2026 and December 18, 2027, respectively. The applicant applied to NRC for an extension to its operating license, extending operation for an additional 20-year period. Based on information provided by the applicant, NRC's preferred alternative is to grant the 20-year extension.

The NRC developed a Generic EIS to streamline the license renewal process based on the premise that environmental impacts of most nuclear power plant license renewals are similar. NRC develops facility-specific Supplemental EIS documents as the facilities apply for license renewal. U.S. EPA acknowledges that mitigation measures that are un-related to nuclear safety and security cannot be included in the NRC license. This includes, but is not limited to, diesel emissions reduction measures. However, because we find these measures to be value-added, we continue to recommend them to the applicant for any construction activities and include them in our comment letters. We encourage the applicant to incorporate mitigation measures into the project, wherever possible.

Based on our review of the Draft Supplemental EIS, U.S. EPA assigns a rating of **Environmental Concerns – Adequate Information, EC-1**. This is based, in part, on potential

impacts to threatened and endangered species, surface water runoff, climate change, and air quality related to refurbishment activities. Our summary of ratings definitions is enclosed.

U.S. EPA commends NRC on the enhanced quality of the document, particularly with the use of color diagrams and maps, where color gradients are used. We also commend NRC on improved communication between our agencies; outreach to us was proactive and timely. U.S. EPA appreciates advanced notice of upcoming projects and meetings.

Thank you for the opportunity to comment on this document. If you have any questions or wish to discuss any aspect of this document, please contact Elizabeth Poole of my staff at 312-353-2087 or poole.elizabeth@epa.gov.

Sincerely,



Kenneth A. Westlake
Chief, NEPA Implementation Section
Office of Enforcement and Compliance Assurance

Enclosures (2): Detailed Comments
 Summary of Ratings

Cc: Nathan Grider, Illinois Department of Natural Resources
 Shawn Cirton, U.S. Fish and Wildlife Service
 Tam Tran, U.S. Nuclear Regulatory Commission
 Alan Keller, Illinois Environmental Protection Agency

**U.S. EPA Detailed Comments on Braidwood Units 1 and 2 License Renewal Draft
Supplemental Environmental Impact Statement
May 2015**

Threatened and Endangered Species

Federally-Listed Species

The Northern Long-Eared Bat (*Myotis septentrionalis*) (NLEB) was Federally-listed as a threatened species in April 2015. USFWS reports that surveys in Shawnee National Forest in Illinois, about 300 miles south of Braidwood, consistently catch NLEBs, and USFWS states they may be found on the Braidwood site. USFWS has also indicated that winter hibernacula are not located on the Braidwood site; however, when NLEBs forage at night and roost during daylight in small numbers in live and dead trees, they change roosts often. The Draft Supplemental EIS indicates "This site would probably not provide prime habitat for long-ear bats even though they are more opportunistic than Indiana bats in roost selection."

Recommendation: U.S. EPA recommends NRC consult with USFWS to determine the following: 1) what type(s) of non-winter habitat NLEBs use, 2) if such habitat exists at the Braidwood site, what protocol should be used and what time of year is best to survey for NLEBs, and 3) if NLEBs are captured at the Braidwood site, what effect license renewal will have on NLEBs. U.S. EPA recommends consultation with USFWS under Section 7 of the Endangered Species Act regarding the NLEB occur before the Final Supplemental EIS is published. If USFWS concurs that license renewal would have no effect on the NLEB, USFWS may propose technical assistance to the applicants to ensure any NLEB habitat located on the Braidwood site remains viable for the NLEB. If technical assistance is provided, we strongly recommend the applicant commit to including the provisions of the technical assistance in its management plans. All correspondence regarding consultation and coordination with USFWS should be included as an appendix to the Final Supplemental EIS and the results of that consultation should be included the Final Supplemental EIS.

As stated in the Draft Supplemental EIS, sheepsnose mussels (*Plethobasus cyphus*) are susceptible to direct and indirect effects (through host fish species) of Braidwood's effluent, due to temperature and current alterations and to chemical contaminants. USFWS' 2013 letter to NRC notes the possible presence of the Federally-listed sheepsnose mussel and requested NRC pay particular attention "to potential impacts from water quality (including temperature) and water quantity that may result from proposed operations" on those species. Mussel surveys were conducted near Braidwood in 2008 and 2009. The most recent survey was conducted in 2012 and sampled 20 sites in the Kankakee River. Sheepsnose were found at two sites in the Kankakee River. However, it is not clear from reviewing the Draft Supplemental EIS where the sheepsnose were found in relation to the project area.

Recommendation: The mussel surveys conducted in the project area are several years old. U.S. EPA recommends NRC consult with USFWS to determine if these surveys are still valid or whether additional mussel surveys are needed before a license renewal decision is made. All correspondence regarding consultation and coordination with U.S. FWS should be included as an appendix to the Final Supplemental EIS and the results of that consultation should be included in the body of the Final Supplemental EIS.

State-Listed Species

As stated in the Draft Supplemental EIS, the Illinois Department of Natural Resources (IDNR) lists 14 State-endangered or threatened species (9 fish, 5 mussels) in Will County, and available aquatic surveys (ESI 2009; HDR 2008, 2014; IDNR 1998; Price et al. 2012) indicate that 10 of these species (5 fish, 5 mussels) occur within the Kankakee River and its tributaries. In December 2009, the IDNR (2009) issued an incidental take permit to the applicant for State-listed species (western sand darter, pallid shiner, river redhorse, purple wartyback, spike, black sandshell, and sheepsnose) that had the potential to be affected by the replacement of the discharge channel. The incidental take permit prohibited construction activities from occurring during the spring spawning season and required relocation of state-listed freshwater mussels prior to the commencement of construction. In July 2010, Ecological Specialists collected and relocated 911 live mussels within the area that had the potential to be impacted by construction. Relocated mussels included 16 State-listed mussels (8 purple wartyback and 8 black sandshell). The 2009 incidental take permit also requires the applicant to complete a follow-up survey of fish and mussels near the construction area 5 years after completion of construction. The Draft Supplemental EIS indicates this survey will be undertaken in 2016.

Recommendation: U.S. EPA recommends NRC conduct the follow-up survey of fish and mussels in the project area and consult with IDNR before a license renewal decision is made. All correspondence regarding consultation and coordination with IDNR should be included as an appendix to the Final Supplemental EIS and the results of that consultation should be included in the body of the Final Supplemental EIS.

Bald Eagles

As stated in Section 3.6.3.3, *Important Species and Habitat*, “The bald eagle, which is Federally-protected under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA), has nested on one of the cooling pond islands in the past. The BGEPA and MBTA provide certain protections to bald and golden (*Aquila chrysaetos*) eagles and migratory birds, respectively. USFWS Chicago Ecological Services Field Office provided technical assistance to the applicant to ensure that eagles were protected and the applicant appropriately complied with the BGEPA. In its Environmental Report, the applicant indicated that bald eagles have not nested on the cooling pond in recent years.” The Draft Supplemental EIS is not clear regarding the time period during which bald eagles have been nesting on the islands in the cooling ponds.

Recommendation: U.S. EPA recommends the Final Supplemental EIS indicate if bald eagles had been observed nesting during the 2014 nesting season and whether it appears that a nest(s) on the cooling pond islands are or will be occupied during the 2015 nesting season, which can begin in January or February¹. If bald eagles are observed nesting on cooling ponds islands during the 2015 nesting season, we recommend a discussion be added to the EIS concerning the applicant’s plans to adhere to USFWS’ 2007 National Bald Eagle Management Guidelines and details of any technical assistance provided by the USFWS. Lastly, passing any information about bald eagle sightings to USFWS helps the agency maintain its sightings database.

¹ http://www.fws.gov/southeast/es/baldeagle/baea_nhstry_snstvtv.html

Wildlife Management Plan

The applicant maintains a Wildlife Habitat Council (WHC)-certified Wildlife Management Plan for the Braidwood site. The plan outlines the goals and projects of the applicant's Wildlife at Work program, which includes ecological management of the cooling pond (referred to as "Braidwood Lake" in the plan) through fish population management, underwater habitat restoration, and shoreline habitat restoration. The plan indicates that the applicant will consider planting other native shoreline plants, in consultation with IDNR in the future. The applicant will also evaluate the potential for controlling and removing some of the non-native invasive common reed (*Phragmites australis*) with mechanical methods and aquatic-safe herbicides. Non-native species are not currently being controlled).

Recommendation: The Draft Supplemental EIS indicates that the applicant intends to seek WHC recertification and continue to implement wildlife protection programs during the term of the proposed re-licensing. U.S. EPA commends the applicant and the Braidwood staff in conducting these activities. We encourage incorporation of additional native shoreline plantings and removal of terrestrial and aquatic non-native, invasive species in the Wildlife Management Plan.

Surface Water

Section 3.5.1.3, *Surface Water Quality and Effluents*, provides locations of the Braidwood National Pollution Discharge Elimination System (NPDES) outfalls in Figure 3-8 and Table 3-6 lists a brief description of each outfall. The discussion of the NPDES permit limits with the associated outfalls that follows is ambiguous.

Recommendation: A table with each NPDES outfall with corresponding monitoring and effluent limits for each would provide the reader with a clearer description of pollutants that could potentially be released from the facility. This information would make the public aware of potential exposures or water quality impacts that may impair or restrict designated uses of that water body.

Section 3.5.1.3, *Surface Water Quality and Effluents*, page 3-31 starting on line 3 mentions that the applicant has prepared a Storm Water Pollution Prevention Plan (SWPPP). Section 3.13.2, *Nonradioactive Waste*, also discusses the SWPPP and that it "identifies potential sources of pollution that may affect the quality of storm water discharges from each permitted outfall".

Recommendation: The Final Supplemental EIS should provide more discussion on these sources of pollution that potentially could be discharged from the facility into the storm water outfall. The Final Supplemental EIS should contain, at minimum, impacts on the environment with respect to quantities released and the effects of those releases on water quality and public exposure.

U.S. EPA acknowledges the discussion beginning on page 4-61 regarding the recently updated requirements under the Clean Water Act Section 316(b) on impingement and entrainment of aquatic organisms. We appreciate the inclusion of this information and note that specific upgrades to the cooling water system, if any, will be identified during the facility's next NPDES permit in July 2019.

Global Climate Change – Aquatic Resources

U.S. EPA notes that there has been one requested and approved variance to the NPDES permit regarding temperature in the past five years². The Draft Supplemental EIS includes some information on discharge and withdrawal rates, but not temperature data for the cooling pond and the Kankakee River, near the outfall. Further, there is no conclusion about whether anticipated increases in water temperature will change the way the plant operates. We are interested in a discussion of both impacts from withdrawal of water (that might be too warm to adequately serve as cooling water) and discharge of water (that might be too warm to discharge per the NPDES permit).

Recommendation: U.S. EPA recommends NRC and the applicant come to a conclusion about whether there is a trend in increasing water temperatures in the cooling pond and the Kankakee River. The Final Supplemental EIS should also identify any potential impacts to operation from increasing water temperatures, in terms of both water withdrawal and water discharge.

Global Climate Change and Greenhouse Gases

On December 18, 2014, the Council on Environmental Quality released revised draft guidance for public comment that describes how Federal departments and agencies should consider the effects of greenhouse gas (GHG) emissions and climate change in their NEPA reviews. The revised draft guidance supersedes the draft GHG and climate change guidance released by CEQ in February 2010. This guidance explains that agencies should consider both the potential effects of a proposed action on climate change, as indicated by its estimated GHG emissions, and the implications of climate change for the environmental effects of a proposed action.

Section 4.15.3 details potential GHG emissions and impacts related to climate change, concluding that GHG emissions would be lower for activities associated with license renewal than for fossil-fuel based energy production, as analyzed in the Draft Supplemental EIS.

Recommendation: We recommend that the Final Supplemental EIS identify opportunities to minimize GHG emissions associated with operation of the facility to the extent feasible during the license renewal period. For example, clean energy options, such as energy efficiency and renewable energy, can be considered in the purchase of maintenance equipment, new equipment and vehicles. See also, U.S. EPA's diesel emission reduction strategies, below, for options to consider. In addition, U.S. EPA recommends that the applicant consider the need to develop adaptation measures to address impacts from climate change on the facility, such as increased intensity and frequency of storm and flood events.

Air Quality

U.S. EPA notes the only proposed refurbishment activities proposed at Braidwood are the steam generator replacement for Unit 2 and reactor pressure vessel head replacement for one or both

²Page 4-65, lines 9-12: *In the past 5 years, Braidwood has reported one noncompliance with Special Condition 4 to the IEPA. In March 2012, blowdown water discharged as effluent to the Kankakee River at Outfall 001 exceeded the permitted temperature limits at points beyond the mixing zone edge due to a period of extremely warm weather and little to no precipitation in Illinois (Exelon 2014l).*

units. Refurbishment activities are expected to take place during normal outage schedules and will be limited to already disturbed areas, therefore impacts are expected to be minimal. However, U.S. EPA recommends the applicant commit to the following diesel emission reduction strategies to further reduce impacts to air quality as a result of the proposed construction activities associated with the license renewal process.

- Use low-sulfur diesel fuel (15 ppm sulfur) in construction vehicles and equipment.
- Retrofit engines with an exhaust filtration device to capture diesel particulate matter before it enters the construction site.
- Position the exhaust pipe so that diesel fumes are directed away from the operator and nearby workers, reducing the fume concentration to which personnel are exposed.
- Use catalytic converters to reduce carbon monoxide, aldehydes, and hydrocarbons in diesel fumes. These devices must be used with low sulfur fuels.
- Use enclosed, climate-controlled cabs pressurized and equipped with high efficiency particulate air (HEPA) filters to reduce the operators' exposure to diesel fumes. Pressurization ensures that air moves from inside to outside. HEPA filters ensure that any incoming air is filtered first.
- Regularly maintain diesel engines, which is essential to keep exhaust emissions low. Follow the manufacturer's recommended maintenance schedule and procedures. Smoke color can signal the need for maintenance. For example, blue/black smoke indicates that an engine requires servicing or tuning.
- Reduce exposure through work practices and training, such as turning off engines when vehicles are stopped for more than a few minutes, training diesel-equipment operators to perform routine inspection, and maintaining filtration devices.
- Repower older vehicles and/or equipment with diesel- or alternatively-fueled engines certified to meet newer, more stringent emissions standards. Purchase new vehicles that are equipped with the most advanced emission control systems available.
- Use electric starting aids such as block heaters with older vehicles to warm the engine reduces diesel emissions.
- Use respirators, which are only an interim measure to control exposure to diesel emissions. In most cases, an N95 respirator is adequate. Workers must be trained and fit-tested before they wear respirators. Depending on work being conducted, and if oil is present, concentrations of particulates present will determine the efficiency and type of mask and respirator. Personnel familiar with the selection, care, and use of respirators must perform the fit testing. Respirators must bear a NIOSH approval number.
- Per Executive Order 13045 on Children's Health³, EPA recommends operators and workers pay particular attention to worksite proximity to places where children live, learn, and play, such as homes, schools, and playgrounds. Diesel emission reduction measures should be strictly implemented near these locations in order to be protective of children's health.

³ Children may be more highly exposed to contaminants because they generally eat more food, drink more water, and have higher inhalation rates relative to their size. Also, children's normal activities, such as putting their hands in their mouths or playing on the ground, can result in higher exposures to contaminants as compared with adults. Children may be more vulnerable to the toxic effects of contaminants because their bodies and systems are not fully developed and their growing organs are more easily harmed. EPA views childhood as a sequence of lifestages, from conception through fetal development, infancy, and adolescence.

SUMMARY OF RATING DEFINITIONS AND FOLLOW UP ACTION

Environmental Impact of the Action

LO-Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impacts. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1-Adequate

The EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collecting is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information

The draft EIS does not contain sufficient information for the EPA to fully assess the environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3-Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640 Policy and Procedures for the Review of the Federal Actions Impacting the Environment

